

The global industrial scene and the MENA region

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Table of Content

- **Acknowledgment and a note**
- **Abstract**
- **Introduction**

Part one

1. Salient features of the world contemporary economy and industry
2. Policy implications of the changes in the world industrial development

Part two

3. Manufacturing value added in the world and the MENA region
4. World exports of manufactured products and the share of the MENA region
5. Composition of Manufacturing Value added and Exports of Manufactured Products by Resource and Technology Base in the world and the MENA region
6. Technological Structure of Export of Manufactured products Worldwide and in the MENA Region
7. The Competitive Industrial Performance of the MENA Countries
8. Drivers of industrial performance in the MENA countries
9. Developments in the structural composition of the manufacturing industries in the MENA countries

Acknowledgment and a note

This paper is based on the information, and data in the UNIDO Industrial development Report 2002/2003, and UNIDO Industrial Statistics Database 3-digit level of ISIC Code (Revision 2). I have used this information and the relevant data in the Tables in the Report to analyze the state of the MENA region and individual MENA countries and compare them with other regions of the world. I had in conducting this study valuable assistance of a number of UNIDO Staff members. They provided me with the documents mentioned above and a host of other data and publications related to the subject. I would like to thank them all, in particular, Tetsuo Yamada, Chief Statistician in UNIDO, Kazuko Puff, Chief, Information and Communication Management Unit, and Elisabeth Mayer, Head, Documentation Department, for their support while visiting UNIDO to prepare the paper. I would like also to thank ERF for its financial support for the project.

Note, Iran is not included among MENA countries or the MENA region in this study. Up-to-date data on Iran were not available in the sources used for the study.

The Global Industrial Scene and the MENA Region

Abstract Globalization and fast changing industrial technologies are creating new momentum in industrial development worldwide. Countries aiming at industrializing and enhancing their industrial sector would have to interact effectively with these changes to capture opportunities and surmount challenges. New criteria have been developed to analyse and assess industrial performance in the global setting. These criteria underline the resource base and technological content of the industrial performance. Successful performers have increased production and exports of medium and high technology products. These performances have been closely linked to the development of a set of drivers that are well grounded in industrial and development policies of the countries. This paper examines the performance of the MENA region and its member countries in the light of the new criteria. The results show that the MENA countries would have to make major efforts to catch up with the new global developments in the industrial sector.

Introduction

There is now a wide realization that industrial development has acquired greater importance under globalization, and that it constitutes an important ingredient of sustainable development strategy. There is a wide realization also that industrial development is no more the outcome of capital accumulation and installation of production capacity only. Greater emphasis will have to be placed on innovation, on technology change, and on development of endogenous technological capabilities in design, in production, in organization, and in management. Industrial development must be conceived as part and parcel of the overall economic policy. This policy should emphasis competitive performance both in the domestic and foreign markets, and aim at creating the right climate for free flow of trade and investment; providing infrastructure; increasing productivity and linking development to equity and poverty eradication.

In other words, industrialization, raising productivity and developing and utilizing society's innovative and technological potential must go hand in hand with macroeconomic and institutional reforms, and should be complemented with development of physical and human capital resources, with a system of governance, and with incentives to eradicate corruption. It requires competitive business environment, sound macroeconomic management, and a fair international trading system.

This paper discusses the salient features of the contemporary industrial developments in the world, and makes an assessment of the industrial performance of the MENA region. The paper falls into two parts. Part one, discusses the most salient features of the world contemporary economy and industry, followed by the policy changes that accompanied these changes. Part two, is a comparative assessment of the industrial performance of the MENA region. The paper uses the data and the information given in the latest UNIDO Industrial Report (2002-2003), and applies the methodologies developed in this Report to compare the performance of the MENA region with other developing regions, as well as the performances of individual MENA countries. The discussion is conducted under the following headings: manufacturing value added in

the MENA region and other regions; world exports of manufactured products and the share of the MENA region; composition of manufactured value added and exports of manufactured products by resource base and technology; technological structure of export of manufactured products worldwide and in the MENA region; the competitive industrial performance of the MENA countries; drivers of industrial performance in the MENA countries; and changes in the structural composition of the manufacturing sector of selected MENA countries.

Part one

1. Salient Features of the World Contemporary Economy and Industry

Several developments in the world in the last three decades left indelible impacts on the world economy. Three of these developments were of particular significance to the world industrial development. The first was the oil crisis of the 1970s, the second, the emergence of new technologies, and the third, the collapse of the Bretton Woods Agreement¹.

The oil crisis ended the era of cheap energy. The resulting high energy costs encouraged development of new technologies that led to fundamental changes in manufacturing processes, and transportation and communication. Production processes were extensively redesigned to become less dependent on inefficient large-scale operations and intensive use of energy. The emergence of new technologies, especially semiconductor silicon chip, induced new systems of information and knowledge-based flexible management. The collapse of the Bretton Woods Agreement, on the other hand, ended the linking of currencies to gold, and therefore, ended the era of rigid and highly immobile exchange rates. A new era was ushered in characterized by floating exchange rates, financial deregulation and globalization of capital markets.

As a result of these (and other) changes a new world economy emerged. The attributes of this new economy are quite different from those that characterized the old economy. The changes were extensive and they covered, inter alia, the organization, production, workforce, role of government, role of research and development, infrastructure, and learning process in the economy and industry. Stimson, et al. captured these changes in a table showing the attributes of the new economy and compared them with those of the old one. This table is presented below with some minor additions².

As a result of these changes, the setting for industrial development and for the operations of industrial firms changed dramatically. Industrial development now can only be envisaged in a world of dynamic learning and technical change, and industrial firms would have to operate under the constant pressure of competition and the demand for increased capabilities. Nations and societies too would have to learn to adjust and update their way of life. With membership of the WTO, it is now difficult to isolate economies from the world market, or isolate national markets from global competition, or isolate firms from improved global efficiency. Governments in this new setting are called upon to create the right environment for businesses to compete internationally, i.e. the old strategies of industrialization through import substitution,

¹ R., J., Stimson et. Al., Regional Economic Development. Springer, 2002. Chapter 1.

² R., J., Stimson et. Al., I bid. Page-3.

trade protection, and government procurements can no longer be pursued. The trend for national liberalization is being strengthened at the international level by new economic rules, 'rules of the game', and many industrial activities are being integrated across national borders under common ownership or control. Technical change is continuously eroding natural protection and the advantage of cheap labour.

2. Policy Changes in Industrial Development

The need to meet the challenges of competition goes well beyond concern with the requirements of promoting some leading industries. It covers enterprises, activities, institutions and policies nation wide. This reality has introduced a new role for governments in developing countries at the national level, at the sectoral level, and at the macro-economic level. Governments, as mentioned earlier, must provide the elements that constitute the right economic environment. This at the national level, means providing security, sound and enforceable legal property rights, transparent and predictable policies, and well-functioning institutions and business environment with low transaction cost. At the sectoral level it implies that suppliers of material inputs and services must be able to meet international standards of cost, quality and delivery. It means also that the national markets for labour, capital and information along with their supporting institutions, must work reasonably efficiently. At the macro-economic level, it means, in addition to weeding out distortions in the market operations, that there is a competitive environment to stimulate firms to invest in capability building, adopt competitive strategies and develop networks and clusters to secure efficiency and dynamism. How well firms can cope with these needs depends on how well policy-makers grasp the nature of the industrial development process in a developing country setting. Thus, while in advanced economies new products, processes and services are the main drivers of competitiveness, and while innovation, flexibility, reliability and service quality count more than low cost per se, in developing countries, enterprises neither operate nor innovate in that sense. They tend to compete by using imported technologies efficiently through considerable technological and managerial effort. They master technologies by importing hardware, blueprints and instructions, and through local learning of new skills, technical information, organizational techniques and marketing supply-chain methods. This process underlines the important fact that industrial development is part and parcel of the whole development process, and that it requires extensive technological, organizational, and managerial effort: and that it is a constant process of learning and innovation³.

³ Lall, S., and M., Teubal. 1998. "Market-stimulating technology policies in developing countries: a framework with examples from East Asia." *World development* 26(8): 1369-1386.

Attributes of the old and new economies

<i>Economy-wide Characteristics</i>	<i>Old Economy/ Industry</i>	<i>New Economy/ Post-industry</i>
<u>1. Organizational form</u> - Scope of competition - Markets - Geographic mobility of business - Role of government	Vertically integrated National Stable Medium-low Provider	Horizontal networks Global Volatile High Steer
<u>2. Labor and Workforce Characteristics</u> - Labor-Management relations - Skills - Requisite education - Policy goal	Adversarial Job-specific skills Task specialization Employment creations	Collaborative Global learning Skills and cross-training Lifelong learning And learning by doing Higher wages and incomes (production)
<u>3. Production Characteristics</u> - Resource Orientation - Relation with other firms - Source of competitive advantage - Primary sources of productivity - Growth driver	Material resources Independent ventures Agglomeration economies Mechanization Capital / labor/ land	Information and knowledge resources Alliance and collaboration Innovation, quality, time to market and cost Digitization Innovation, invention and knowledge
<u>4. Role of Research and Innovation in the Economy</u> - Economy	Low moderate	Intensive
<u>5. Production Methodology</u>	Mass production	Flexible production
<u>6. Role of Government</u>	Infrastructure provider, restrictive trade and industrial policies	Privatization, WTO membership, Regional groupings, partnership, and environmental concerns
<u>7. Characteristics of Infrastructure</u> - Form - Transport - Power	Hand (physical) Miles of highways Standard generation plant	Soft (information and organizations) Travel time reduction via application of information technology Linked power grid (co-generation)
<u>8. Organizational flow</u>	Highly regulated	Deregulation
<u>9. Telecommunication</u>	Miles of copper wire	Wireless and fiber
<u>10. Learning</u>	Talking head	Distance learning

Source: R.J. Stimson et. al., Regional Economic Development, Springer, 2002. Page- 3.

Part two

This part is a comparative analysis of the performance of the performance of the industrial sector world wide and in the MENA region. The data available cover 1985 to 1998.

3. Manufacturing Value Added in the World and the MENA Region

In table 1, the world manufacturing value added (MVA) grew by 6.5 percent annually during the period 1985-1998. The share of developing countries exceeded that of industrialized countries by 1 percent. The share of industrialized countries in world MVA remained dominant, representing 80 percent and 78.2 percent respectively in 1985 and 1998. During the same years, the share of developing countries in the world MVA increased from 19.2 percent to 21.7 percent. However, while the share of East Asian countries increased markedly, from 8.2 percent to 11.5, the share of the MENA region increased only marginally; from 1.4 percent to 1.7 percent. The increase in the share of East Asian countries in the MVA of developing countries was even more pronounced; it rose from 42.7 percent in 1985 to 53.0 percent in 1998. The increase in the share of the MENA region was negligible; from 7.5 percent to 7.7 percent. The picture is more vivid when expressed in per capita terms. While the world per capita MVA increased from (\$ billions) 619 in 1985, to 1094 in 1998 (1.7 fold), in the industrialized countries it went up from 2579 to 5040 (almost two folds). In developing countries it increased from 147 to 300 (two folds), in East Asian countries from 145 to 387 (2.7 folds), and in the MENA region from 202 to 392 (less than two folds). In other words, the rate of growth of per capita MVA in the MENA region was below the average rate for developing countries during the period concerned.

Table 1 Manufacturing Value Added in the MENA Region and other Regions, 1985 and 1998 (\$ Billions and %)

Country groups and Regions	1985				1998			
	Value (billion \$)	World share (%)	Developing countries shares (%)	Per capita (billion \$)	Value (billion \$)	World shares (%)	Developing economies shares (%)	Per capita (billion \$)
World	2,480.0	100.0	n.a	619.0	5,636.1	100.0	n.a	1,094.0
Industrial countries	2,003.3	80.8	n.a	257.9	4,240.8	75.2	n.a	5,040.0
Transition economies	...	...	...	...	169.5	3.0	n.a	725.0
Developing countries	476.6	19.2	100.0	147.0	1,225.8	21.7	100.0	300.0
Least developing countries	5.6	0.2	0.7	44.0	35.8	0.6	2.9	51.0
East Asia	203.2	8.2	42.7	145.0	649.8	11.5	53.0	397.0
South Asia	42.0	1.7	8.8	42.0	83.6	1.5	6.8	65.0
Latin America	171.1	6.9	35.9	462.0	360.0	6.4	29.4	771.0
Sub-Sahara Africa	24.1	1.0	5.1	83.0	38.2	0.7	3.1	92.0
MENA Countries	35.8	1.4	7.5	202.0	94.1	1.7	7.7	392.0

Source: Based on the data in Table A2.1, page 149, in UNIDO Industrial Development Report, 2002/2003

4. World Exports of Manufactured Products and the Share of the MENA Countries

In tables 2-a, and b, developments in the exports of manufactured products worldwide during the period 1985 and 1998 are shown. Two types of changes are discernable. One relates to the degree of concentration in manufactured exports among the developing countries, and the second, to the performance of different world regions.

Regarding the first, while worldwide, country concentration in MVA and manufactured exports are declining, mainly due to the declining share of the United States in world MVA, and the falling shares of most industrialized countries, the concentration of exports among developing countries is increasing⁴. In table 2-a, nine developing countries exported almost 80 percent of the total manufactured exports of the developing countries. Some developing countries, with smaller share in MVA, had greater share in manufactured exports; and China, which was not even included in the exporters list in 1985, has now become a leader both in the exporters list and MVA list for developing countries. None of the MENA countries featured in those two lists.

Table 2-a Main Developing Countries by Share in Manufacturing Value Added and Manufacturing Exports in 1998 (%)

Country	China	Brazil	Korea S	Mexico	Taiwan	India	Argentina	Turkey	Thailand	Indonesia
Share in MVA (%)	29	12	8	7	6	5	4	4	3	33
Country	China	Korea S	Taiwan	Mexico	Singapore	Malaysia	Thailand	Philippines	Indonesia	
Share in manufactured exports (%)	16	12	11	11	11	7	5	3	3	

Source: based on information in UNIDO Industrial Development Report 2002-2003, page 29.

⁴ UNIDO Industrial Development Report, 2002-2003, Page 29, para. 7

**Table 2-b Manufacturing Exports by the MENA Region and Other Regions, 1985 and 1998
(\$ Billion, and %)**

Country groups and Regions	1985				1998				Growth rates	
	Value (billion \$)	World share (%)	Developing countries shares (%)	Per capita (billion \$)	Value (billion \$)	World shares (%)	Developing economies shares (%)	Per capita (billion \$)	Total	Per Capita
World	1239.2	100.0	n.a.	292.5	4230.0	100.0	n.a.	821.0	9.9	8.3
Industrial countries	1045.0	84.3	n.a.	1345.2	3125.5	73.9	n.a.	3714.4	8.8	8.1
Transition economies	...	...	n.a.	...	117.1	2.8	n.a.	500.7	...	...
Developing countries	1947.0	15.7	100.0	60.2	987.4	23.3	100.0	242.2	13.3	11.3
Least developing countries	1.4	0.1	0.7	70.0	6.0	0.1	0.6	17.5	12.0	7.3
East Asia	118.0	9.5	60.5	84.0	686.0	16.0	65.9	409.0	14.5	12.9
South Asia	9.0	0.8	4.9	9.0	41.0	1.0	4.0	32.0	12.4	10.2
Latin America	43.0	3.5	22.1	116.0	188.0	4.4	18.1	404.0	12.0	10.1
Sub-Sahara Africa	7.0	0.6	3.7	25.0	19.0	0.4	1.8	45.0	8.0	4.6
MENA Countries	17.0	1.4	8.8	96.0	53.0	1.2	5.1	220.0	9.1	6.6

Source: Based on Table A2.2, page 150, in UNIDO Industrial Development Report 2002/2003.

Export data are for the world economy.

5. Composition of Manufacturing Value added and Exports of Manufactured Products by Resource and Technology Base.

Tables 3 and 4 carry the analysis of performance of MVA and exports of manufactured products one step further. They investigate the resource base and the technology contents of these two variables. (This step in itself is a step for further analysis later). What do these two tables tell us? UNIDO, in line with OECD, differentiates manufactured activities according to their resource bases and their technological contents, and applies this classification both to MVA and exports of manufactured products. Exports of manufactured products are classified into three categories: low-tech, medium-tech, and high-tech exports. (Definition of these categories is given in the box in the Annex). It is important to note, however, that as countries progress in their industrialization process, the share of resource based manufacturing industries and that of low tech industries increasingly decline. It should also be noted that 'medium-tech exports is supposed to reflect national technological capabilities better than high-tech exports. Strong export performance in medium-tech products is often based on deeper local manufacturing⁵.

⁵ UNIDO Industrial Development Report 2002/2003, page 32. para.6.

Table-3 shows that there were only marginal changes in the resource base and the technological content of the world MVA between 1985 and 1998. The share of resource based industries, at 27.1 percent, remained exactly the same, and that of medium and high tech, increased by 1.9 percent only in the period covered. Developing economies made the largest contribution to this increase; 6.2 percent as against 1.9 percent for industrialized economies. The share of low tech activities in the world MVA also declined marginally; from 16.2 percent to 14.1 percent. The greater contribution to the increase in the share of medium and high tech in the world MVA came from the East Asian countries, followed by the MENA region, and South Asia. What is equally important to note however is that the share of the MENA region in the resource based and low technology remained among the highest.

Table 3 Resource Base and Technological Structure of Industrial Activity in the MENA Region and in other Regions (%)

Country groups & regions	1985			1998			Change in medium and high tech 1985 to 1998 (percentage points)
	Resource based	Low tech	Medium and high tech	Resource based	Low tech	Medium and high tech	
World	27.1	16.2	56.8	27.1	14.1	58.7	1.9
Industrial countries	25.5	15.3	59.3	25.5	13.3	61.2	1.0
Transition economies	...	...	...	45.1	12.7	42.2	...
Developing countries	37.1	20.4	42.5	33.7	17.6	48.7	6.2
Least developing countries	52.1	25.0	22.9	44.4	31.6	24.0	1.1
East Asia	31.9	23.8	44.3	28.0	17.6	54.4	10.1
South Asia	30.3	19.9	49.8	27.6	19.7	52.7	2.9
Latin America	39.6	18.0	42.5	44.6	15.7	39.7	-2.8
Sub-Sahara Africa	42.7	18.7	38.6	43.6	18.8	37.6	-1.0
MENA Countries	48.6	20.7	30.7	41.4	21.8	36.8	6.1

Source: Based on Tables A2.2, P.150, and A2.3,p.151, in UNIDO Industrial Development Report 2002/2003,

6. Technological Structure of Export of Manufactured Products Worldwide and in the MENA Region

Table 4 describes the technological structure of export of manufactured products in the world and the regions. It shows that the ratio of the resource based manufactured exports declined worldwide and in every region. For the developing countries as a whole, it declined from 34.1 percent in 1985, to 18.2 percent in 1998. Regionally, the highest decline was recorded for Latin American countries, followed by East Asian countries. The ratio for the Sub-Saharan Africa and the MENA region also declined, but at 46 percent and 40 percent, respectively in 1998, these ratios remained among the highest in the world.

Worldwide the ratio of low-tech manufactured exports remained stagnant. The ratio of medium and high tech exports increased markedly, from 57.7 percent in 1985 to 63.8 percent in 1998. The increase in the share of high tech exports was even higher, from 16.8 percent to 25.1 percent. Developing countries as a group recorded a substantial increase in the share of medium and high tech exports, from 33.5 percent to 53.8 percent. The increase in the share of high tech exports alone was even higher, it more than doubled. The highest increase was recorded for East Asia, with a staggering share of 60 percent in 1998, up from 39.1 percent in 1985. The share of high tech was even higher. It went up from 15.8 percent to 36.1; an increase of 228 percent in the two years mentioned. In the MENA region, the share of medium and high exports also increased, it went up from 15.6 percent in 1985 to 22.5 percent in 1998. But this was relatively a very small increase compared to that for East Asia and Latin America. Indeed both the share of medium and high tech, and the share of high tech separately in the MENA region remained (at 22.5 percent and 3 percent respectively in 1998) the second lowest in the world after the share of the sub-Saharan Africa and the Least Developed Countries.

Table 4 Technological Structures of Manufacturing Exports by the MENA Region and Other Regions, 1985 & 1998. (%)

Country groups & regions	Resource based	Low tech	Medium tech	High tech	Medium and high tech	Resource based	Low tech	Medium tech	High tech	Medium and high tech	Change in medium and high tech 1985 to 1998 (percentage point)
World	23.7	18.6	40.9	16.8	57.7	14.7	18.8	38.7	25.1	63.8	6.1
Industrial countries	21.0	16.1	44.7	18.2	62.9	16.8	15.5	43.3	24.5	67.8	4.8
Transition countries	...	...	...	...	...	26.4	26.7	34.9	12.0	46.9	...
Developing countries	34.1	32.2	21.9	11.6	33.5	18.2	28.0	25.6	28.2	53.8	20.3
Least developing countries	39.6	55.9	3.8	0.7	4.5	12.6	84.0	3.1	0.3	3.4	-1.1
East Asia	22.7	38.2	23.3	15.8	39.1	12.1	28.1	23.6	36.1	59.7	20.6
South Asia	32.3	55.8	9.2	2.8	12.0	21.4	62.8	11.4	4.4	15.8	3.8
Latin America	51.3	16.9	24.8	7.0	31.8	24.9	18.2	37.2	19.7	56.9	25.1
Sub-Sahara Africa	57.9	17.3	18.2	6.6	24.8	45.8	23.3	25.5	5.3	30.8	6.0
MENA Countries	59.9	24.5	14.1	1.5	15.6	39.9	37.6	18.8	3.7	22.5	6.9

Source: Based on tables A2.2, P.150, A2.3, P.151 in UNIDO Industrial Development Report 2002/2003,

7. The Competitive Industrial Performance of the MENA Countries

In Table 5, the MENA countries are ranked by basic indicators of industrial performance and by elements of composite index of competitive industrial performance, in 1985 and 1998. The ranking covers 80 countries. These indicators for the individual MENA countries (high enough to be included in the Table) are illustrated in figure 1 in the Annex.

Table 5 Ranking MENA Countries by Basic Indicators of Industrial Performance and by Index of Competitive Industrial Performance, 1985 and 1998 (Nos. and %).

MENA Countries	1985								1998							
	Manufacturing value added per capita index		Manufacturing exports per capita index		Share of medium- and high tech activities in manufacturing value added index		Share of medium-tech and high-tech products in manufactured exports-final index		Manufacturing value added per capita index		Manufacturing exports per capita index		Share of medium-tech and high-tech activities in manufactured value added-final index		share of medium-tech and high-tech products in manufactured exports-final index	
	Rank	index value	Rank	Index value	Rank	index value	Rank	Index value	Rank	Index value	Rank	Index value	Rank	Index value	Rank	Index value
Bahrain	25	0.224	24	0.153	27	0.102	31	0.099	27	0.189	28	0.105	29	0.095	42	0.089
Saudi Arabia	33	0.140	31	0.092	34	0.079	41	0.063	42	0.072	42	0.046	41	0.041	54	0.047
Turkey	43	0.061	44	0.038	35	0.079	36	0.082	39	0.083	40	0.047	38	0.048	38	0.108
Jordan	50	0.049	50	0.049	52	0.021	60	0.022	61	0.022	61	0.012	60	0.012	63	0.024
Tunisia	54	0.043	49	0.029	49	0.023	40	0.064	49	0.046	48	0.031	48	0.027	45	0.068
Oman	56	0.040	55	0.024	55	0.024	39	0.069	54	0.034	54	0.020	55	0.015	59	0.032
Egypt	58	0.032	61	0.017	61	0.017	61	0.012	52	0.038	51	0.023	51	0.019	57	0.038
Morocco	62	0.026	60	0.017	60	0.017	46	0.038	59	0.025	60	0.014	59	0.012	53	0.048
Algeria	00	0000	00	0000	00	0000	54	0.029	64	0.018	64	0.010	63	0.009	74	0.009

Source: UNIDO Industrial Development Report 2002/2003, pages 179 and 180.

- The Table and the graphs in the Annex, show that almost all MENA countries fell below the world average ranking for the four performance indicators listed. They all fell in the third and fourth quartile in the distribution of the ranks. (Oman ranked 24-27 in 1985, but in 1998, it lost its ranks in three indicators, and in the fourth it joined the position of the rest of the MENA countries).
- Turkey, among all the MENA countries, was the only country whose ranks came closer to the world average. It also managed to improve its ranks in MVA per capita and manufactured exports per capita, respectively, from 43 and 44 in 1985, to 39 and 40 in 1998. In the same year, however, its ranks in the share of medium and high tech in MVA, and in exports, which are, as shown earlier, more important indicators of industrial progress, fell below their 1985 level.
- Egypt's ranks in all four indicators were below Turkey. Although Egypt improved its ranks in the four indicators by 4 to 10 percentage points between 1985 and 1998. Its ranks nevertheless remained comparatively very low.

- Tunisia ranked very low in all four indicators, and did not show much improvement in the period concerned. Its rank in medium and high tech exports actually declined in 1998.
- Morocco also ranked very low in all four indicators. Its ranks either remained stagnant or declined during the period. Its performance in medium and high tech exports was similar to that of Tunisia.
- Saudi Arabia with ranks already below the mid points in 1985 lost its relative position in all four indicators in 1998.
- For most of the remaining MENA countries, the ranking either remained stagnant, or declined further during the period of the study.

8. Drivers of industrial performance in the MENA countries

The UNIDO Industrial Development Report 2002-2003, identifies among many complex factors five that proved to affect industrial performance strongly. Terming them “industrial performance drivers”, the Report establishes significant correlations between the performance of the drivers and the competitive industrial performance of the countries concerned. The five drivers include, skills, measured by enrolment in technical schools; technological effort, measured by R&D by productive enterprises; inflows of foreign direct investment; royalties and technical payments abroad; and modern infrastructure*.

Below, two tables are constructed to show how the MENA region and individual MENA countries performed in relation to these drivers compared to other world regions and individual countries. However, we conducted

* UNIDO Report notes the following on the Industrial Performance Drivers (IPD)(See pages 34 to 40)

The correlation between the competitive Industrial Index (CIP) and the IPD is positive and significant (see box 4.2, page 71 in the Report), and it is consistent overtime. Most drivers are also related to each other. Successful countries have used different strategies to combine the drivers, the ranking of the countries by the drivers are stable over time, but some countries managed to change their relative positions significantly overtime with respect to the drivers. The impact of the drivers on CIP also tended to change overtime “with FDI in particular gaining in significance with the rise in integrated production system (See UNIDO, I bid. Box 4.1. Page 59). Domestic technological effort is the most consistent and significant of the drivers. Assessing its performance however should be combined with the other complementary drivers, namely, skilled manpower and access to foreign technology. Physical structure (omitted in our discussion) is an important facilitator but not a causal factor. The distribution of the drivers in the developing countries is uneven and it is becoming increasingly so. Finally, two general observations about the experiences of the countries in the Report would be useful. First the type of strategy countries pursued to achieve high performance have by and large consisted of a combination of high R&D and FDI, but with varying degree in the level of concentration. Second, the main characteristics of the low performers have been low R&D combined with low level of skills accumulation, and low level of FDI inflows.

the analysis for the first four drivers only. The data available in the Report for modern infrastructure in MENA region (personal computers, and mobile telephones in 1998) were not in our view sufficiently up-to-date to reflect the state of the region accurately. The Region has witnessed significant changes in recent years regarding this indicator.

The Report shows that the economies that performed well in developing their industrial sector also performed well in each and every one of the drivers. It also shows that the gap in technical enrolment between industrialized and developing countries are very wide and widening significantly when the countries in Transition are also included with the former⁶.

Table 6 Drivers of Industrial Performance: World Regions and the MENA countries (Percentages).

World Regions	Technical enrolment		R&D by productive enterprises		Foreign direct investment		Royalties	
	1987	1995-98	1985	1995-98	1981-85	1993-98	1985	1998
Industrialized countries	48.4	44.9	97.8	94.3	75.5	63.7	83.7	66.2
Transitional economies	....	14.3	...	...	...	...	...	0.8
Developing countries	51.6	45.7	2.2	5.1	24.5	33.3	16.3	21.4
Least Developed countries	1.4	0.9	...	...	0.1	0.2	...	0.1
East Asia	18.5	21.5	1.1exld.China	4	10.7	20.5	...	16.4
South Asia	9.7	13.3	0.3	0.1	0.3	0.8	0.2	0.2
Latin America	14.4	8.6	0.4	0.8	7.3	10	6.3	3.3
Sub-Saharan Africa	0.6	0.8	0.2	....	0.9	1	1.2	0.3
MENA countries	3.3	3.5	0.1	0.1	5.3	1	0.1	1

Source: Based on information in Tables A2.5-A2.1, pp.153-159.in UNIDO Industrial Development Report 2002-2003,

Table-6, shows that in 1987 and 1998, the number enrolled in technical schools in industrialized economies were 5.8 and 7.0 per one thousand population respectively, against 1.5 and 1.6, respectively, for developing economies. The share of developing countries from the world total enrolment in technical schools however declined noticeably between 1987and 1998. But this could be explained mainly by the substantial increase in the share of the countries in transition. The share of the MENA region in the world total increased only marginally from 3.3 percent in 1987 to 3.5 in 1998, similarly for the number of technicians per one thousand populations, it increased from 1.7 to 2.3. These two figures incidentally were not far different from the average recorded for developing economies in the same years.

⁶ UNIDO, I bid. Pages 153-159

The disparity between industrialized economies and developing economies becomes more vivid when comparing ‘technological effort’, the second driver. Industrialized economies represented between 94 to 98 percent of the world expenditure on R&D by productive enterprises. The developing countries increased their share from 2.2 percent in 1985 to 5.1 percent in 1998, but these shares were still comparatively very small. The share of the MENA countries remained a negligible 0.1 percent throughout the period.

A closer look at this driver for the MENA region reveals striking results compared to the world and developing countries. For example, the share of manufacturing R&D in the MENA region in the world share of R&D in manufacturing value added amounted to a meager 0.2 percent in 1985, and increased to 0.3 percent only in 1998. Whereas the average share of developing countries increased from 0.4 percent to 1.5 percent, of East Asia, it went up to 2.2 percent, and of industrialized economies from 4.7 percent to about 8.0 percent.

The comparison is even more striking in terms of per capita. The per capita expenditure on manufacturing R&D in the MENA region was US \$(million) only 0.4 in 1985, and increased to US \$(million) 1.4 in 1998. The average in developing countries increased from US \$(million) 0.6 to US \$(million) 4.6, in industrialized economies from US \$(million) 122.3 to US \$(million) 402.4, and in East Asia from US \$(million) 3.2 to US \$(million) 31.0. On all accounts in this important indicator, the performance of the MENA region was the lowest, and the increases recorded the smallest, compared to the average of developing countries and that of well performing regions in the world⁷.

The performance of the foreign direct investment inflows in the MENA region is equally disappointing. Table 6 shows that the share of industrialized economies fell substantially. This was to the advantage of developing countries. It also shows that developing regions, except for the MENA region, increased their shares in the world inflows of foreign direct investment. The share of the MENA region however declined from 5.3 percent in 1985, to 1.0 percent in 1998. This low share persisted through 2002⁸.

The fifth column in Table-6 tells a different story and warrants a special consideration. This column describes payment of royalties and technical payments abroad. It is meant to “capture arm’s-length purchase of know-how, patents, licences and blueprints—imports of embodied technology in non-equity forms⁹. It is a proxy for technology purchase by local manufacturing firms. A healthy situation would occur when there are improvements in all the technology based indicators, i.e. when the skills development, spending on R&D, share of foreign direct investment, and spending on transfer of technology from abroad are rising in a complementary manner. It is here where an odd picture emerges with regard to the performance of the MENA region. The absolute value of expenditure on royalties abroad increased from US \$ 12.8 billion in 1985 to US \$ 690.1 billion in 1998, registering an increase in the share of the MENA region in the world payments of royalties from 0.1 percent to a full 1.0 percent during the two years mentioned. This steep rise in payments abroad, however, was not, as the discussion above just showed, accompanied with a proportionate increase in the performance of the related drivers. This is a clear indication that the installation of production capacities in the MENA region was not accompanied with a sufficient development in local technological capacities.

⁷ UNIDO, I bid, Table A2.7, p.155.

⁸ See UNCTAD World Investment Report, 2002.

⁹ See UNIDO, Ibid, page-37, para.7.

Table-7 in the annex shows the performance of individual MENA countries in relation to each driver in 1985 and 1998.

The five drivers covered include skill index, R&D spending per capita by productive enterprises, FDI inflows to the country, royalties paid abroad for the use of technical materials, and spending on infrastructure in the country. The data are taken for two years, 1985 and 1998. The table shows three things. First, how did each individual MENA country ranked in each of the drivers during the years mentioned, second, which MENA country was able either to sustain its rank vis-à-vis other countries, or improve on it during the period, and which country lost its 1985 rank in 1998. And third, how did the ranking of the MENA countries compare worldwide. The matrix concerning the MENA countries has a total of 65 cells in the Table. In 5 cases, the MENA countries were able either to maintain their rank or lost the rank to another MENA member. In 25 of the cases, the countries actually improved their relative position in the world scale of the drivers. But in 34 cases the individual MENA country lost their relative position to other countries. The Table also shows that the rankings of the MENA countries were overwhelmingly below the mid-point recorded for the world.

9. Developments in the Structural Composition of the Manufacturing Industries in the MENA Countries.

The share of manufacturing sector in the Arab MENA countries increased from 6-7 percent of the GDP in current prices during 1957-1977 to around 11-12 percent in 1992-1994. Since then it remained more or less the same. The share of manufacturing employment and exports followed the same pattern. There have been some changes in the composition of the manufacturing sector itself. Although still remains dominated by conventional goods: food, beverages, textiles, clothing, and intermediate products, the relative share of such industrial branches as industrial chemicals, and machinery have recorded tangible increases in value added and employment. Labour productivity in manufacturing increased modestly. Output per worker, at constant 1970 prices, increased by 2.8 percent during the period 1970-1995. This increase while higher than the average growth reported for the Latin American countries during that period, was still far below the 5 percent increase recorded for East Asian countries. The highest productivity growth was recorded in petroleum refineries. (See UNESCWA Twenty five Years in the Service of Development, p66, footnote 11).

Table 8 in the Annex, is an attempt to bring the structural changes in the MENA countries up to date. Using UNIDO INDSTAT3 2003 Database (3- digit level of ISIC Code-Revision 2), the Table is constructed to draw an approximate picture for the most recent structural changes that have taken place in a sample of the MENA countries. Because of data limitation, only three countries could be selected. Comprehensive and up-to-date data were not available for others. Even for some of the countries selected, some of the required data were missing, as can be seen in the Table. Three sets of data are used to draw a picture for the structural changes, value added, employment, and wages and salaries. The data cover the aggregate manufacturing industry, and five ISIC branches, namely, textiles (ISIC 321) and Apparel (ISIC 322-4), industrial chemicals (ISIC 352), Petroleum products (ISIC 353), and Machinery and electrical equipment (ISIC 383-5).

In terms of valued added a mixed picture emerges with regard to the structural changes in the manufacturing of the three countries selected. While the share of textiles at a two digit level declines in all three countries, the share of apparel (at three digit level) increases markedly in all three. Apparel in fact scores the highest growth

rate among the industries in all three. The share of medium-tech industries also recorded a marked change especially in Egypt and Turkey. The share of machinery also changed but not by a big margin. A similar pattern emerged also for the share in employment and wages. The rate of growth of employment in the manufacturing sector in all three countries however was lower than that of value added and wages. This may be an indication that workers productivity in the manufacturing sector in all three countries have improved. More information however is needed to ascertain this.

Conclusion

Recent industrial development in the world is characterized by diversity and divergence. The industrialization gap remained wide between developed and developing countries and was widening among the developing countries themselves. While a few developing countries have done very well in recent years in coping with the fast changing industrial scene, the majority of the developing countries trailed well behind. None of the MENA countries was among the developing countries that performed very well. Not many of them, if any, in fact, as this study showed, managed to exploit fully the opportunities created by the rapid technical change, free trade, and more mobility of resources. When the performance of the MENA countries is cast in an international comparative analysis and on the basis of established performance criteria, the majority remained either stagnant or lost their relative importance in the international market.

Annex

Box-1

UNIDO following OECD uses the following classification for the terminologies used in Table 3, 4, and 5.

Resource based manufactures: include processed foods and tobacco, simple wood products, refined petroleum products, dyes, leather, organic chemicals. These products can be labour-intensive or capital-intensive. Competitive advantages in these products generally arise from local availability of natural resources.

Low-tech manufactures: mainly textiles, garments, footwear, other leather products, simple metal and plastic products, furniture and glassware. The technology used is well-diffused, embodied mainly in capital equipment, and characterized with low R&D, low skill requirements and low economies of scale. Products are usually undifferentiated and labour cost is the main element of cost. Barriers to entry are very low, and competitive advantages come from price rather than quality or brand names.

Medium-tech manufactures: include heavy industry products like industrial chemicals, machinery and relatively standard electrical and electronic products. The technology used is complex but not fast changing, with moderate level of R&D expenditures, but advanced engineering and design skills and large scales of production. Barriers to entry tend to be high because of capital requirements and strong learning effects in operation, design and engineering.

High-tech manufactures: complex electrical and electronic (including telecommunications) products, aerospace, precision instruments, fine chemicals and pharmaceuticals. Barriers to entry are the highest because of generally fast-changing technologies and complex skills. Some of the highly innovative products in this group call for large R&D investment, advanced technology infrastructure and close interaction between firms, universities and research institutions. Many activities, however, particularly in electronics, have final process with simple technologies, where low wages can be an important competitive factor. The high value-to-weight ratio of these products allows segments of the value chain of these products to be broken up and located across long distances.

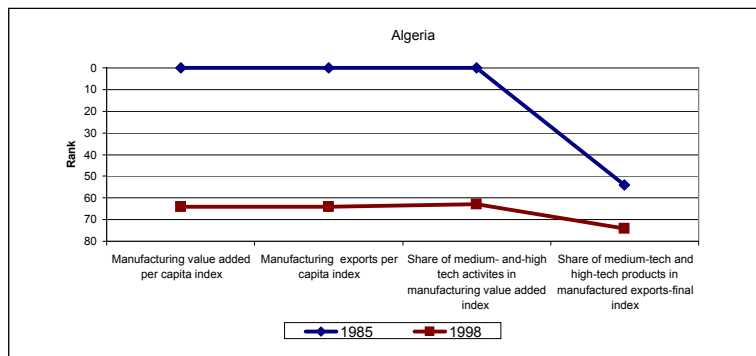
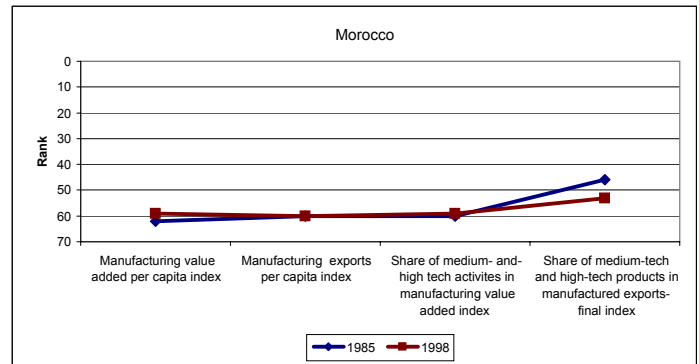
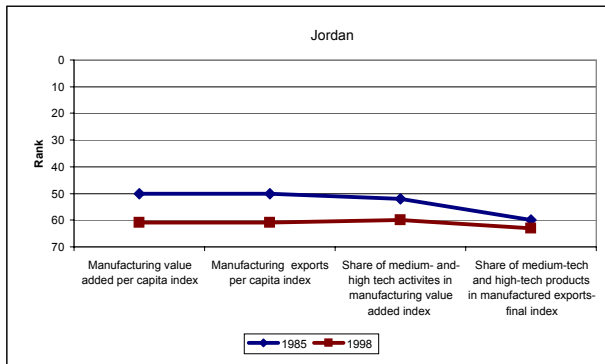
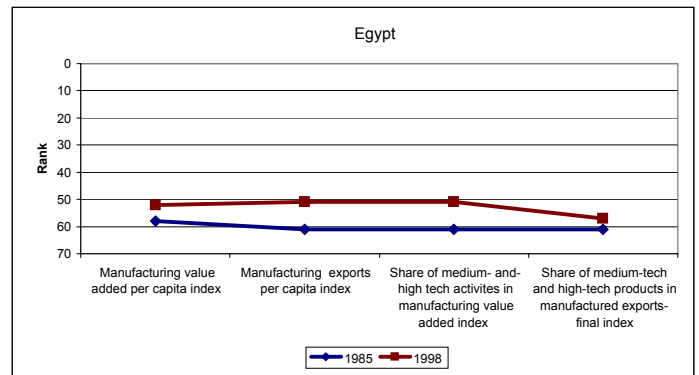
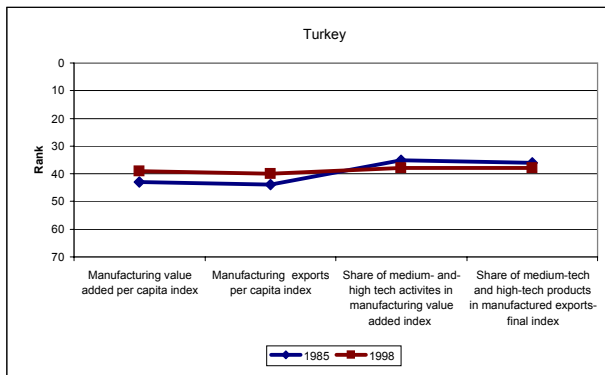
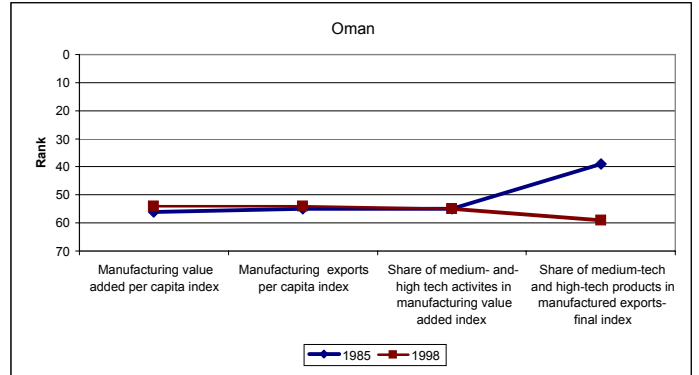
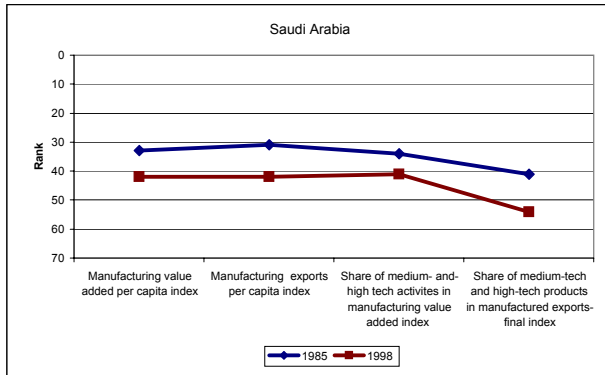
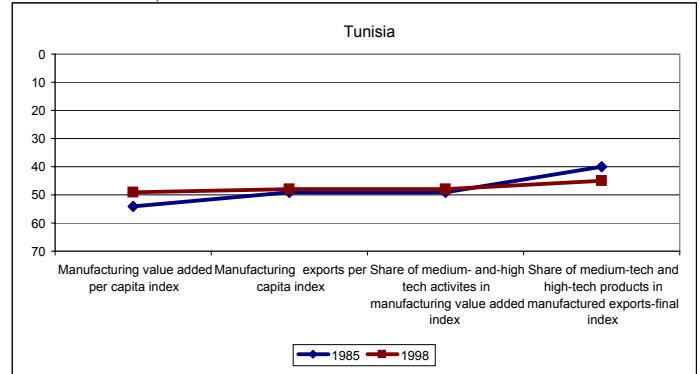
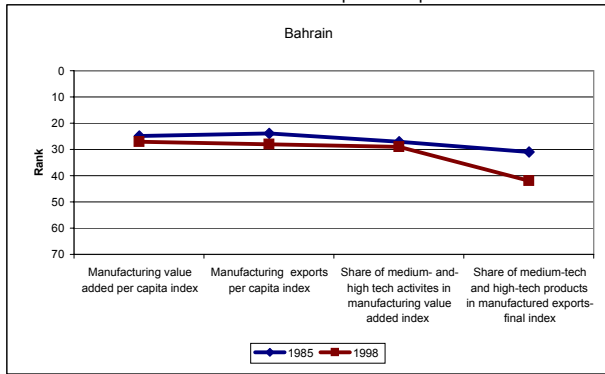
Finally, it is to be noted that compared to the classifications of export products fewer classification was possible under MVA because of the limitation of data classification under the latter.

Source: See Box 2.1, 'Manufacturing products by technology intensity', UNIDO Industrial Report 2002-2003. Page 30.

Ranks	Skills index		R&D per capita by productive enterprises		Foreign Direct investment		Royalties per capita		Infrastructure index	
	1985	1998	1985	1998	1985	1998	1985	1998	1985	1998
1	S Korea	S Korea	Switzerland	Germany	Singapore	Singapore	Singapore	Ireland	USA	USA
2	USA	Finland	Switzerland	Japan	NewZeland	Belgium	HongKong	Singapore	Canada	Canada
3	Canada	Australia	Japan	Sweden	Switzerland	Sweden	Netherlands	Netherland	Sweden	Singapore
4	Canada	Finland	USA	USA	Austraila	NewZeland	Switzerland	Hong Kong	Finland	Sweden
6									Bahrain	Denmark
19					Tuinsia	Malaysia				
20					Jordan	Chile				
23									S. Arabia	Ireland
27							Egypt	Slovenia		
30			Jordan	Hungary						
32			Turkey	Poland	Egypt	Venezuela				
33	Chile	Bahrian							S. Arabia	Portugal
34	Jordan	Poland					Indonesia	Egypt		
35									Oman	Turkey
36							Mexico	Morocco		
37			Tunisia	Turkey					Jordan	Uruguay
39					S. Arabia	Brazil				
40	Colombia	Jordan								
41	Egypt	Costa Rica							Turkey	South Africa
43							Morocco	South Africa		
44									Colombia	Oman
45	Hungary	Algeria							Algeria	Colombia
46	South Africa	Turkey			Honduras	Oman				
48	Morocco	Hungary								
49				Egypt					Tunisia	Brazil
50	S.Arabia	Thailand		colombia			Turkey	Colombia		
51	Algeria	El salvador		Jordan			Tunisia	El. Salvador	Egypt	Jordan
52	Brazil	Tunisia							Peru	Tunisia
53	Honduras	Egypt		Algeria						
54	Nicaragua	Morocco		S. Arabia	Morocco	Albania				
55	Tunisia	Indonesia		Peru						
56	Malaysia	S. Arabia		Morocco			Algeria	Zimababwi	El Salvador	Algeria
57				Phillippine	Yemen	Jordan				
58				Hounduras			Turkey	Russian Fed.	India	Tunisia
60				Sri Lanka					Phillippines	Egypt
61				Yemen	Peru	Egypt			Morocco	Morocco
62				Tunisia+others	Phillippine	Turkey				
63	Oman	Sri Lanka								

[illegible]

Graphs: Competitive Industrial Performance of Mena Countries, 1985 & 1



	Egypt				Turkey				Morocco			
	1985		1998		1985		1998		1985		1998	
	Value added	% of total	Value added	% of total	value added	% of total	value add	% of total	value added	% of total	value added	% of total
	US \$ m		US \$ m		US \$ m		US \$ m		US \$ m		US \$ m	
300 total manufacturing	5467	100	6913	100	10448	100	36077	100	1173	100	5483	100
321 textiles	919	17	875	13	1289	12	4110	11	172	15	454	8
322-4 Wearing appara	55	1	316	5	205	2	2093	6	76	6	553	10
351 Industrial chemicals	272	5	772	11	457	4	1368	4	166	14	540	10
352 Other Chemicals	384	7	764	11	394	4	2249	6	13	1	299	5
sub-total	656	12	1536	22	851	8	3617	10	179	15	839	15
353 Petroleum products	110	2	.....	...	1514	14	5229	14	...	...	...	...
354 Misc. Petrol.prods	145	3	62	1	152	1	358	1	...	...	...	...
Sub-total	255	5	62	1	1666	16	5587	15				
383 Machinery excp.electrical	156	3	400	6	456	4	1617	4	...	...
384 Machinery electrical	338	6	293	4	532	5	1826	5	56	5	164	3
384Transport	199	4	428	6	534	5	3092	9	49	4	191	3
385 professional scientific	25	0	16	0	9	0	196	1	...	...	10	0
Sub-total	718	13	1137	16	1531	15	6731	19	105	9	365	7
	1985		1998		1985		1998		1985		1998	
	Employment	% of total	Employment	% of total	Employment	% of total	Employment	% of total	Employment	% of total	Employment	% of total
300 total manufacturing	907	100	1147	100	844	100	1058	100	271	100	496	100
321 textiles	257	28	259	23	174	21	236	22	49	18	71	14
322-4 Wearing appara	19	2	72	6	37	4	127	12	37	14	127	26
351 Industrial chemicals	52	6	35	3	32	4	21	2	18	7	14	3
352 Other Chemicals	43	5	58	5	21	2	33	3	...	...	22	4
Sub-Total	95	10	93	8	53	6	54	5	...	...	...
353 Petroleum products	12	1	6	1	4	0	5	0			...	
354 Misc. Petrol.prods.	6	1	46	4	4	0	4	0				0
Sub-total	18	2	52	5	8	1	9	1				0
383 Machinery excp.electrical	20	2	28	2	49	6	51	5	6	2	6	1
384 Machinery electrical	23	3	34	3	37	4	48	5	9	3	14	3
384Transport	34	4	6	1	55	7	63	6	6	2	12	2
385 professional scientific	5	1	...	...	2	0	6	1	1	...	2	0
Sub-total	82	9	68	6	143	17	168	16	22	8	34	7
	1985		1998		1985		1998		1985		1998	
	wages and salaries	% of total	wages and salaries	% of total	wages and salaries	% of total	wages and salaries	% of total	wages and salaries	% of total	wages and salaries	% of total
	US \$ m		US \$ m		US \$ m		US \$ m		US \$ m		US \$ m	
300 total manufacturing	3021	100	not av.		2209	100	7225	100	612	100	2020	100
321 textiles	485	16	1464		370	17	1159	16	99	16	215	11
322-4 Wearing appara	32	1	263		56	3	552	8	48	8	348	17
351 Industrial chemicals												
352 Other Chemicals												
Sub-Total	244	8	1150		184	8	659	9	69	11	277	14
353 Petroleum products							145	2	...		...
354 Misc. Petrol.prods.												
Sub-total	76	3	98		37	2	...		...		...
383 Machinery excp.electrical												
384 Machinery electrical												
384Transport												
385 professional scientific												
Sub-total	330	11	1082		543	25	1825	25	117	19	303	15